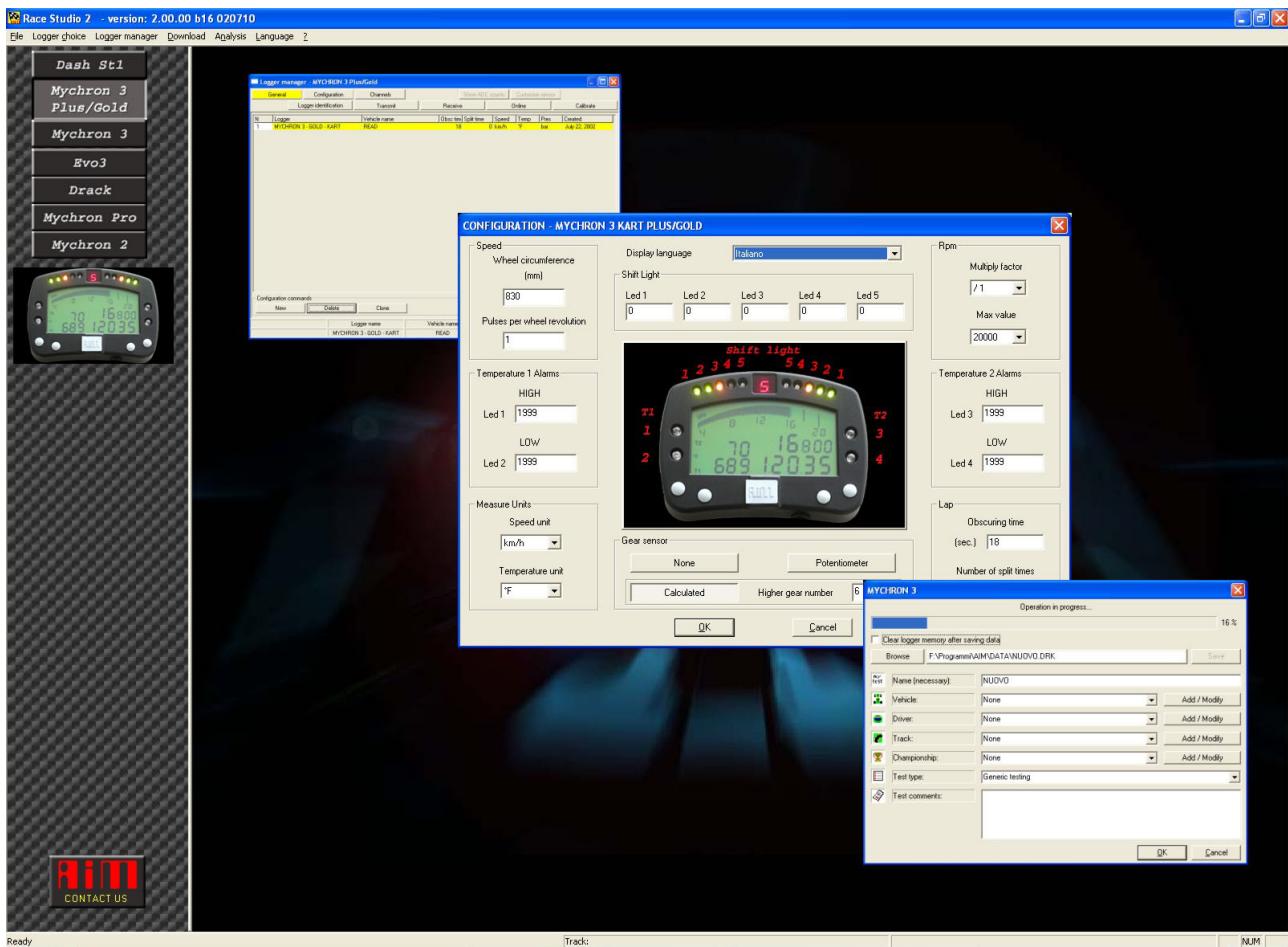


# Race Studio 2



## Race Studio 2 Configuration User's manual

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# Chapter 1 – “How to install Race Studio 2”

## 1.1 – Race Studio 2 installation

To install the software, insert the CD inside the CD-ROM drive: if the *autorun* option is enabled (most of cases), the software installation will automatically start, otherwise click twice on the *SETUP* icon. The 1<sup>st</sup> screenshot that will appear on your PC’s monitor concerns the installation language choice. Through a pop-up menu it will be possible to choose the preferred language, as shown in Figure 1.1.



Fig. 1.1 – Race Studio 2 installation: language choice

It is reminded that the installation language choice does not entail the software’s working with only that language.

If on your PC you have installed a previous version of **Race Studio 2**, it will appear the window shown in Figure 1.2:

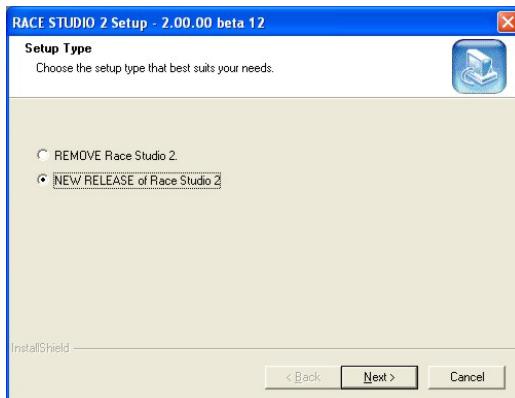


Fig. 1.2 – Race Studio 2 installation

It is possible to choose whether to *Remove* the previous version or to *Install* the new release. By choosing this second option, the software will automatically uninstall the previous version and install the new one.

Otherwise, if you do not have older versions of **Race Studio 2** on your PC, it will appear the standard installation window (see Figure 1.3):

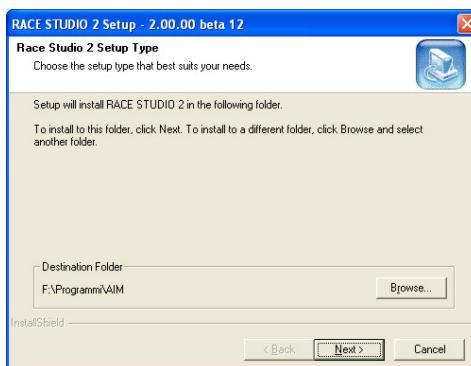
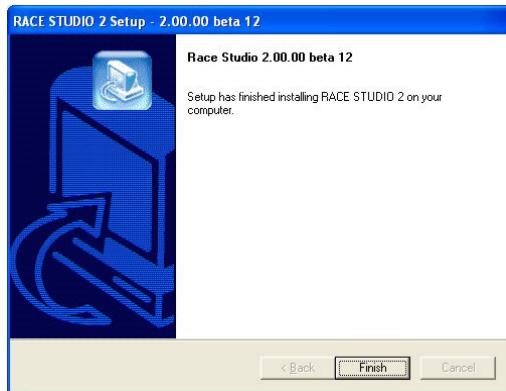


Fig. 1.3 – Race Studio 2 installation

By using button **Browse**, it is possible to choose the software installation folder: if you click on the **Next** button without choosing the installation folder, the software will be installed in the default folder “X:\Program files\AIM”, where “X” represents the Hard Drive in which you installed the operative system.

The following screenshot is the final one: please click on **Finish** button and, then, run the program.



**Fig. 1.4– Race Studio 2 installation**

To run the program, click twice on **Race Studio 2** icon, located directly on your computer desktop, once the installation has finished.

To uninstall **Race Studio 2** from your computer, please enter Check Panel Mode (click start / settings / Control Panel) and click on Software Installation icon. Now select **Race Studio 2** from the program list and push button *Install / Remove*: the software will be automatically removed from your computer.

If you wish to update **Race Studio 2**, please connect to our website [www.aim-sportline.com](http://www.aim-sportline.com) and go to “Download” page, where it is possible to download the latest updates. To install the update, click twice on the downloaded file and follow the instructions you see on your PC’s monitor.

**Race Studio 2 program has been designed and developed to guarantee the maximum working reliability and its proper working has been tested with the following operative systems: Microsoft Windows 98™, Windows 2000™, Windows Me™, Windows Xp™. Microsoft Windows 95™, Windows NT™ and other operative systems (Linux, Unix, Macintosh™) are not supported.**

If you have troubles during installation or normal working time, please check out our website or contact Aim.

## 1.2 – Race Studio 2 installation troubleshooting

MDAC components are used by **Race Studio 2** and **Race Studio Analysis**. As a matter of fact Microsoft produced several operating systems in few years, each of them coming with a different release of MDAC.

**Race Studio 2** needs some MDAC components that must be later than a certain date, so you may have two cases:

1. If your OS has not the proper components, **Race Studio 2** cannot work.
2. If your OS has proper components, **Race Studio 2** works

The solution for the first case is to upgrade such components using supplied file ‘mdac\_typ.exe’. As explained in Microsoft website MDAC actually are OS upgrades, and it is difficult for a developer outside Microsoft to supply MDAC following a proper way. That’s why we decided to supply our customers with upgrades from Microsoft.

Here is a **quick solution** we suggest:

1. Install **Race Studio 2**, if it works then it’s all OK!
2. If **Race Studio 2** doesn’t work, install the MDAC components by running the “[mdac\\_typ.exe](#)” file supplied or the latest release of the same file available on Microsoft webpage. If it works then it’s all OK!

MDAC releases since 2.6 do not supply some components that are still useful for old Microsoft operating systems (Windows 98 first edition, as maybe they think is no more used), so:

3. If **Race Studio 2** still doesn’t work, install MDAC old components by running the “[Jet40Sp3\\_Comp.exe](#)” file supplied or the latest release of the same file available on Microsoft webpage. It HAS to work!

## Chapter 2 – “How to install the USB drivers”

### 2.1 – USB drivers installation

Please, read carefully these instructions in order to correctly install the USB drivers: an incorrect installation may cause system's malfunctions.

To connect your data logger to the PC's USB port, please use the USB cable furnished as equipment. When the PC and the instrument are **switched off**, connect your data logger to the PC's USB and then switch on both computer and the data logger (it is suggested to switch on before the PC and later on the gauge). During restart time, the operative system will recognize a new hardware and will ask you to install the proper driver, driver that is included either in **Race Studio 2** installation CD-ROM or in the “X:/Program files/AIM/USB\_DRIVER” folder on your PC”.

The driver file name is **WDUSB503.inf**.

In the following pages it will be reported two examples concerning the USB drivers' installation for Microsoft Windows 98™ and Microsoft Windows 2000™ operative systems.

#### How to install the USB Driver for Windows 98™:

1. Press [Next] button when the “Add new Hardware wizard” window appears.
2. Select [Search for the best driver for your device] and press the [Next] button again.
3. Place the **Race Studio 2** disk in the computer's CD-ROM drive if it is not already there.
4. If the *autorun* option is enabled the system will try to install **Race Studio 2**. As you have already installed it, please exit installation menu. If the *autorun* option is enabled, go directly to next installation step.
5. Place a check beside [CD-ROM drive] and click the [Next] button.
6. Click the [Next] button again.
7. The installation software has to search for **WDUSB503.inf**.
8. Click the [Finish] button once reached the end of the installation.
9. Restart the computer if prompted.

#### How to install the USB Driver for Windows 2000™:

1. Press [Next] button when the “Found new Hardware wizard” window appears.
2. Select [Search for a suitable driver for my device] and press the [Next] button again.
3. Place the **Race Studio 2** disk in the computer's CD-ROM drive if it is not already there.
4. If the *autorun* option is enabled the system will try to install **Race Studio 2**. As you have already installed it, please exit installation menu. If the *autorun* option is enabled, please go directly to next installation step.
5. Place a check beside [CD-ROM drive] and click the [Next] button.
6. Click the [Next] button again.
7. The installation software has to search for **WDUSB503.inf**.
8. Click [Yes] if the “Digital Signature Not Found” window appears.
9. Click [No to All] if the “Confirm File Replace” window appears.
10. Click the [Finish] button once reached the end of the installation.
11. Restart the computer if prompted.

If the USB drivers have been correctly installed, when your data logger is switched on, in your PC's Device management window (click Start \ Settings \ Control Panel \ System \ Device management) you will find the voice **HID (Human Interface Device) Class** and, in subnode, **WDUSB503**, as showed in Figure 2.1.

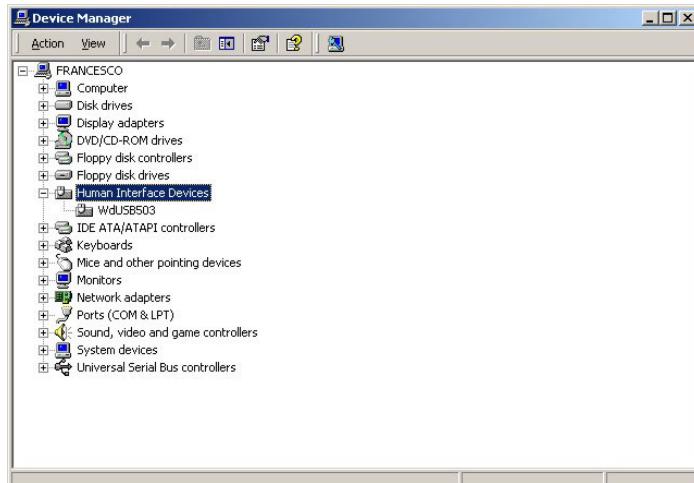


Fig. 2.1 – *Device manager* window: USB drivers correctly installed

## 2.2 – USB drivers troubleshooting

In this paragraph it will be described the possible solutions to the mostly common USB drivers installation troubles encountered.

1. Once connected **MyChron 3 Plus/Gold** to a switched on PC, the automatic USB drivers installation does not start:
  - a. Control that the instrument is correctly plugged in the PC's USB port.
  - b. Verify that both PC and the data logger are switched on.
  - c. Verify that the internal battery charge status is good. Otherwise, connect the data logger to an external power source (voltage = 12 V).
  - d. If the data logger switches on but the automatic USB drivers installation does not begin, try to plug the USB cable into another USB port (if a second USB port is available).
  - e. If available, try to use another USB cable to plug the data logger in a PC's USB port.
2. The automatic USB drivers installation starts but the USB driver is not properly installed:
  - a. Control your PC's Control Panel (click Start \ Settings \ Control Panel \ System \ Device management): if you see a voice like **Unknown Peripheral** or **Unknown USB device** with a yellow question mark or a red cross (see Figure 2.2), please select that voice and remove it (click the mouse right button and select the “Remove” option). Then switch off your data logger, unplug the USB cable from the PC's USB port, re-plug the USB cable in the PC's USB port and repeat the previously described installation procedure.

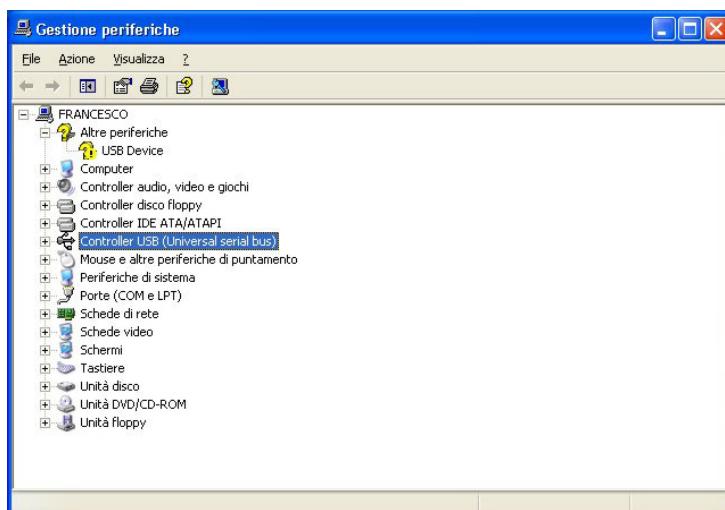


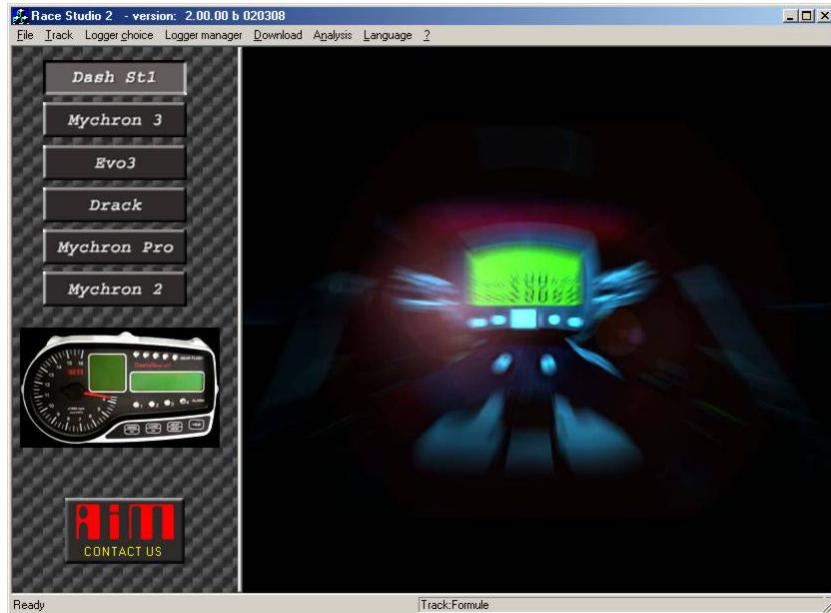
Fig. 2.2 – *Device manager* window: USB drivers installation problems

- b. If you see a yellow question mark again, please select the voice and, instead of removing it, click on the “Property” option; then choose the “Driver” tab and finally select the “Driver Update” option. It is now possible to repeat the installation procedure described in the “How to install the USB Driver for Windows” paragraph. Please remember to specify the correct path for the USB drivers, which is the **Race Studio 2** CD-ROM drive.
3. In case your PC has not been able to automatically recognize your data logger or the two procedures previously described had not succeeded in solving your problems, you have to install the driver **manually** as here above explained:
  - Go to Control panel window.
  - Select the “New Hardware” icon.
  - Click twice button “Next”.
  - Place a check beside “No, I want to select the hardware from list”.
  - Select “HID class” (or “Human Interface Device”).
  - Specify the correct path for the USB driver (i.e. **Race Studio 2** CD-ROM drive).

## Chapter 3 – “How to configure MyChron 3 Basic”

**It is reminded that, before starting the via software configuration, to install Race Studio 2 and the USB drivers as mentioned in the previous chapter. It is also reminded, before configuring the instrument, to connect it to a PC and to switch it on.**

Once run the program clicking on the **Race Studio 2** icon, it will appear the following screenshot:



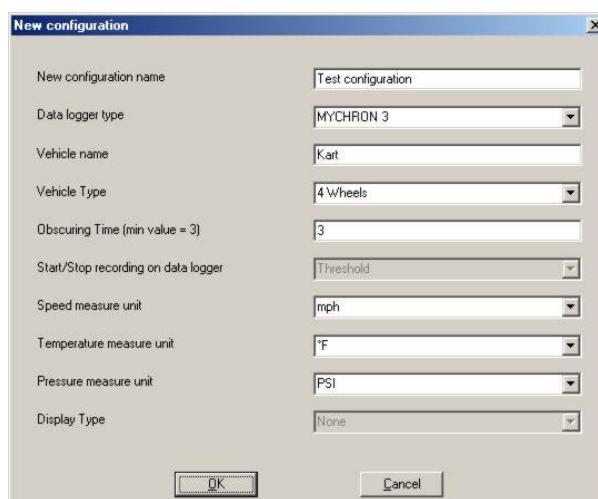
**Fig. 3.1– Race Studio 2 main window**

On the left of Figure 3.1 you will see the icons corresponding to all the Aim instruments supported by **Race Studio 2**: **Dash ST1**, **MyChron 3**, **Evo 3**, **Drack**, **MyChron Pro**, **MyChron 2**. To select **MyChron 3**, please click on the corresponding icon.

### 3.1 – Creating a new configuration

Now it is possible to configure the instrument: in order to start the configuration procedure, please click on the icon Logger manager.

It will appear the following screenshot:

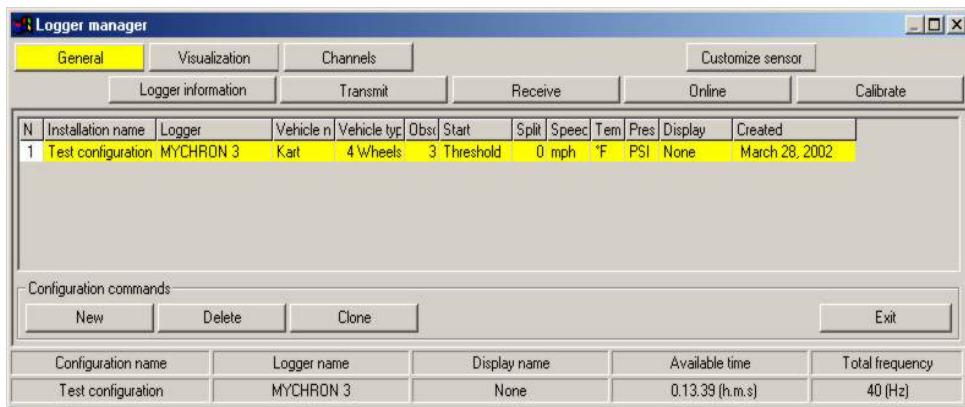


**Fig. 3.2– New configuration window**

The user will have to set some parameters, listed here above:

- New configuration name;
- Data logger type;
- Vehicle name;
- Vehicle's wheels number: at choice between 2 and 4;
- Beacon receiver's obscuring time: minimum value 3 and maximum value 59 seconds;
- Speed measure unit: at choice between km/h and Mph;
- Temperature measure unit: at choice between °C and °F;
- Pressure measure unit: at choice between Bar and PSI.

Once filled all the boxes of the previous screenshot, click on the *OK* pushbutton to save the settings. On your PC's monitor it will appear the following window:



**Fig. 3.3– *Logger manager* main window**

Here above you can see a short description of all the pushbuttons that can be used to configure your **MyChron 3**:

- *General*;
- *Visualization*: this pushbutton allows you to set the pressure and temperature alarms values and to set the RPM changing gear threshold values;
- *Channels*: by using this option you can set how many and which kind of sensors are installed on your vehicle;
- *Logger information*: this button allows the user to detect the characteristics of the data logger connected to the PC;
- *Transmit*: once configured the data logger, the parameters have to be transmitted to the instrument by clicking this button;
- *Receive*: if you connect to a PC a data logger of whom you do not know the configuration, you may detect its configuration, by clicking the *Receive* button, and to save it in the configuration's database;
- *Online*: the *Online* button allows the user to make a data acquisition simulation, in order to verify if the new configuration is correct and if it has correctly been transmitted to the data logger;
- *New / Delete / Clone*: these three buttons allows the user to create a new configuration, to delete an old one or to clone an existing one;
- *Exit*: this button is used to exit the “*Logger manager*” menu.

### 3.2 – Channels settings

By clicking on the Visualization icon it will appear the screenshot showed on Figure 3.4.

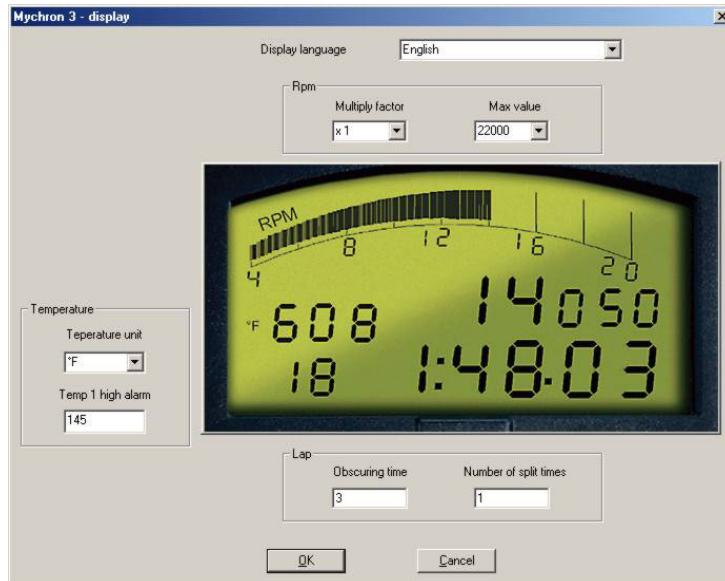


Fig. 3.4– Channels configuration window

The user can set the following parameters:

- *Display language*: at choice between English, Italian, French, German, Spanish and Slovenian;
- *Maximum RPM value*: the user can set both the *Sparks for revs* (X1, X2 and /2) and *Maximum RPM value* (8,000 / 10,000 / 12,000 / 16,000 / 20,000 / 22,000 / 25,000 RPM);
- *Temperature*: it is possible to set both the *Temperature measure unit* ( °C or °F ) and an *Alarm value*;
- *Lap*: the user can set both the *Obscuring time* (in a range between 3 and 59 seconds) and the number of *Split times*.

### 3.3 – Transmitting the configuration

It is recommended, before transmitting the configuration, to switch on the instrument and to connect it to the PC's USB port.

Once set all the parameters, it is necessary to transmit the configuration to the instrument.

In order to transmit the configuration, you have to press the *Transmit* pushbutton and the system, automatically, will download the configuration from the PC to the instrument's Flash memory.

If the data logger is not correctly connected to the PC's USB port or if the data logger is switched off when transmitting the configuration, it will appear the screenshot showed on Figure 3.5.

**Please, ensure that the data logger is switched on and correctly connected to the PC and then retry to transmit the configuration.**



Fig. 3.5– Warning message window

## Chapter 4 – “How to configure MyChron 3 Plus/Gold KART”

**For a correct, complete and fast MyChron 3 Plus/Gold KART configuration, it is recommended to use a PC and the software Race Studio 2.**

MyChron 3 Plus/Gold may be configured both via keyboard and via software, by using **Race Studio 2**.

The “via software configuration” allows the user to set some parameters that cannot be set using the keyboard. For instance, if you wish to measure the lateral g-force (in order to create a track map), you have to calibrate the internal lateral accelerometer via software.

**It is reminded that, before starting the via software configuration, to install Race Studio 2 and the USB drivers as mentioned in the previous chapter. It is also reminded, before configuring the instrument, to connect it to a PC and to switch it on.**

Once launched the program, by double-clicking on the **Race Studio 2** icon on your PC’s desktop or by selecting the **Race Studio 2** shortcut in your PC’s *Start* toolbar, it will appear the software’s main window, shown in Figure 4.1.

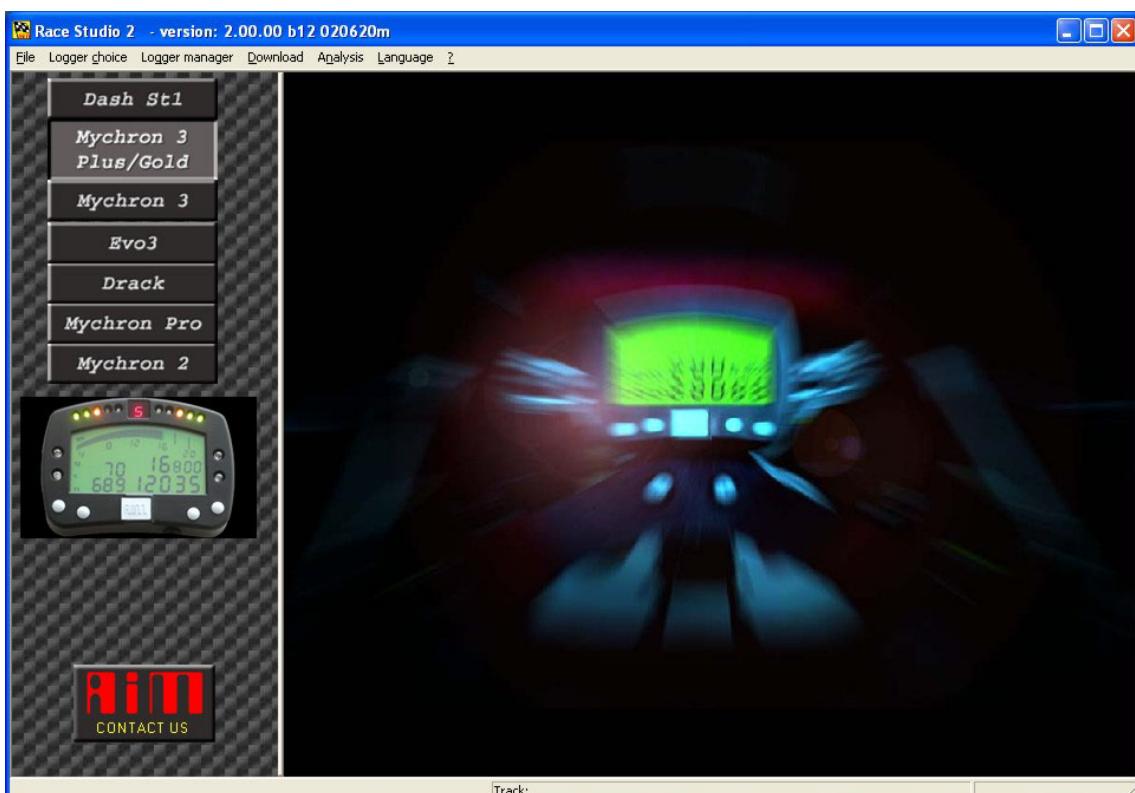


Fig. 4.1 – *Race Studio 2* main window

On the left of the window you may see the icons corresponding to all the Aim instruments supported by **Race Studio 2**: **Dash ST1**, **MyChron 3 Plus/Gold**, **MyChron 3**, **Evo 3**, **Drack**, **MyChron Pro**, and **MyChron 2**.

To select **MyChron 3 Plus/Gold**, please click on the corresponding icon (as showed in the previous image).

## 4.1 – Creating a new configuration

It is now possible to configure the instrument: in order to start the configuration procedure, please click on the *Logger manager* icon, located in **Race Studio 2** toolbar. It will appear the New configuration window, as shown in Figure 4.2:



Fig. 4.2– New configuration window

The user will have to set some parameters, listed here above:

- Data logger type: at choice between **MyChron 3 Plus/Gold** and **Auto/Kart**. Please, remember to select the **KART** version;
- Vehicle name;
- Speed measure unit: at choice between km/h and Mph;
- Temperature measure unit: at choice between °C and °F;

Once filled all the boxes of the previous screenshot, click on the *OK* pushbutton to save the settings. On your PC's monitor it will appear the *Logger manager* main window:

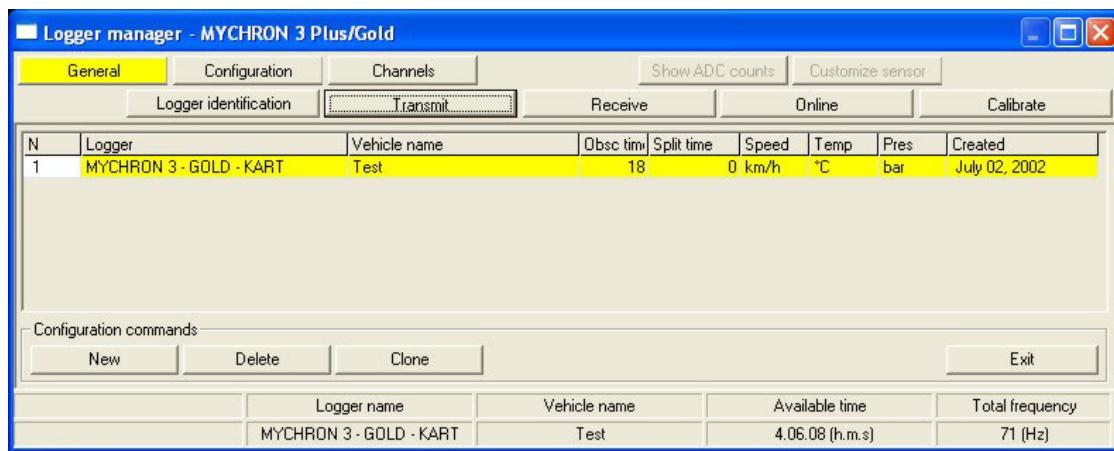


Fig. 4.3– Logger manager main window

Here above you can see a short description of all the pushbuttons that can be used to configure your **MyChron 3 Plus/Gold**:

- *General*: with this pushbutton you activate the *Logger manager* main window;
- *Configuration*: this pushbutton will open a very useful dialog box, where the user is allowed to set the temperature alarm values, the RPM shift light threshold values, the RPM and speed parameters and the measure units;
- *Channels*: by using this option you may visualize the sensors installed on your vehicle;
- *Logger identification*: this button allows the user to detect the characteristics of the data logger connected to the PC;
- *Transmit*: once configured the data logger, the parameters have to be transmitted to the instrument by clicking this button;
- *Receive*: if you connect to a PC a data logger of whom you do not know the configuration, you may detect its configuration, by clicking the *Receive* button, and to save it in the configuration's database;
- *Online*: the *Online* button allows the user to make a data acquisition simulation, in order to verify if the new configuration is correct and if it has been correctly transmitted to the data logger;
- *Calibrate*: this button allows the user to calibrate both the internal lateral accelerometer (**Gold** versions only) and the gear sensor;
- *New / Delete / Clone*: these three buttons allows the user to create a new configuration, to delete an old one or to clone an existing one;
- *Exit*: this button is used to exit the “*Logger manager*” menu.

## 4.2 – Channels

Clicking on the *Channels* pushbutton it will appear the screenshot shown in Figure 4.4.

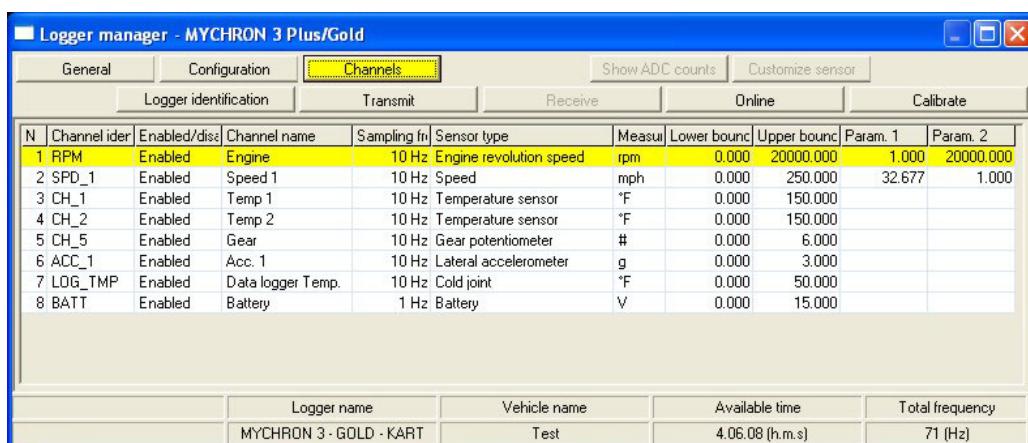


Fig. 4.4– *Channels* configuration window

In the window previously shown, it is possible to set the channels acquired by your **MyChron 3 Plus/Gold**.

- Channels labelled as CH\_1 and CH\_2 are two temperature inputs: the instrument automatically recognizes if the temperature sensor is a thermocouple or a thermoresistance, so no temperature sensor configuration is needed;
- Channel labelled as CH\_5 is the gear sensor: this sensor, installed inside the gearbox, allows your **MyChron 3 Plus/Gold** to measure the engaged gear;
- If your **MyChron 3** is a **Gold** version one, you may also measure the lateral g-force using an internal lateral g-sensor, labelled as ACC\_1; this sensor will allow you to create the circuit map.

## 4.3 – Channels configuration

Your **MyChron 3 Plus/Gold** is equipped with 14 fully configurable coloured led; the 4 ones placed on the left and right of the display unit represent the 4 analog inputs (temperatures and pressures) *maximum* alarms, while the other 10 led in the upper part of the display are called *Shift light*.

By clicking on the *Configuration* icon it will appear the screenshot reported in Figure 4.5.

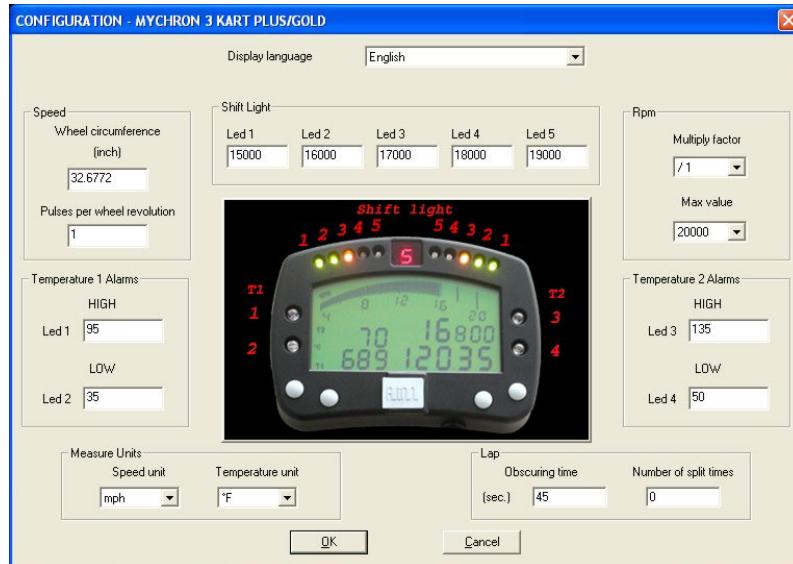


Fig. 4.5– *Channels* configuration window

- *Wheel circumference*: this function allows the user to set the kart wheel circumference (in mm or in inches); this value is fundamental to correlate the wheel revolution speed and the kart speed.
- *Number of pulses per wheel revolution*: this function allows the user to set the number of magnets installed on the wheel in order to measure the wheel revolution speed. When the sensor passes by the magnet, it generates an electric pulse: if I install just one magnet, the instrument will measure one pulse per wheel revolution, while if I install more than one magnet the sensor will acquire more than one pulse per wheel revolution.
- *Configuring the Shift light led*: in the window's middle part it is possible to set 5 RPM values, each one corresponding to a coloured led. The five led progressively turn on in order to indicate the pilot to shift gear. To set the proper RPM value, you have to modify the values in the different boxes. The 10 led are so coloured: the first two on the left and the first two on the right are green coloured, the middle ones are orange coloured and the last four are red. When the engine reaches the RPM value set in the 5<sup>th</sup> box, all the five led start blinking, informing the pilot to change gear. If a value is set to 0, the corresponding led will be disabled.
- *Number of pulses per engine revolution*: this option represents the number of pulses, acquired from the spark plug wire, per engine revolution. A two-strokes one-cylinder engine has one spark signal per revolution, while a four-strokes one-cylinder engine has one spark signal per two engine revolutions.
- *Maximum RPM value*: this option allows the user to set the Maximum RPM value acquired by the instrument.
- *Configuring the temperature alarm led*: the first thing you have to do is to decide which led has to indicate a particular alarm; in order to keep a correspondence with the via keyboard configuration, it is suggested to respect the following sequence: *Maximum temperature 1* on led 1, *Minimum temperature 1* on led number 2, *Maximum temperature 2* on led 3 and *Minimum temperature 2* on led 4.
- *Configuring the measure unit*: the user can set the Speed (Km/h or Mph) and Temperature (°C or °F) measure unit.

- *Configuring the lap parameters:* by setting these two parameters, the user will be able to acquire the correct lap time and, if more than one optic transmitter is available, the split times. For further information on these parameters, please refer to the “Beacon obscuring time and split’s number” paragraph reported in the “Configuration functions” paragraph.
- *Language selection:* the user may choose the display text language among 6 different languages: Italian, English, German, Spanish, French and Slovenian.

#### 4.4 – Transmitting the configuration

It is recommended, before transmitting the configuration, to switch on the instrument and to connect it to the PC’s USB port.

Once set all the parameters, it is necessary to transmit the configuration to the instrument. In order to transmit the configuration, you have to press the *Transmit* pushbutton and the system, automatically, will download the configuration from the PC to the instrument’s Flash memory.

If the data logger is not correctly connected to the PC’s USB port or if the data logger is switched off when transmitting the configuration, it will appear the following screenshot on your PC’s monitor:



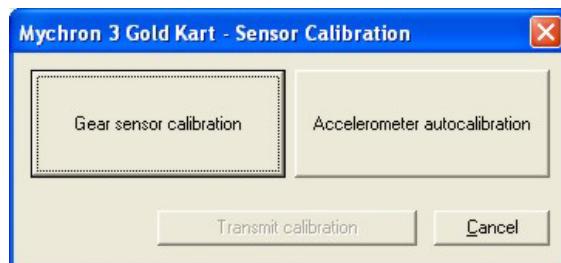
**Fig. 4.6 – Warning message window**

Please, ensure that the data logger is switched on and correctly connected to the PC and then retry to transmit the configuration.

#### 4.5 – Accelerometer autocalibration (Gold versions only)

Once the configuration has been transmitted to the instrument, it is possible to calibrate the gear sensor and the accelerometers installed on the car. In particular the sensors that need to be calibrated are the gear sensor (**MyChron 3 Plus** and **Gold** versions) and the lateral/external accelerometer (**Gold** versions only).

To enter calibration dialog box, reported here above, it is necessary to press “Calibrate” button.



**Fig. 4.7 – Sensor calibration window**

In this window you can see two big buttons: the “Gear sensor calibration” button, on the left, and the “Accelerometer autocalibration” one, on the right. In the window’s lower part there are two other buttons: the “Cancel” one, used to exit calibration, and the “Transmit calibration” one (which becomes enabled once you have calibrated the gear sensor or the accelerometer).

By pressing the “Accelerometer autocalibration” button, the software will automatically autocalibrate the internal lateral accelerometer and, if installed, the external g-sensor/gyroscope.

## 4.6 – Gear calibration

To calibrate the gear sensor, once entered calibration mode by clicking the “calibrate” button, to select the “Gear sensor calibration” button. It will appear the following screenshot:

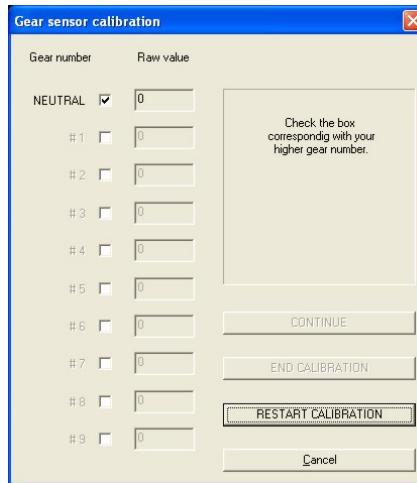


Fig. 4.8– *Gear sensor calibration* window

Now, please follow the instructions listed here above:

- Check the box corresponding to the gearbox’s gear number;
- Engage the neutral gear;
- Press the “Continue” button;
- Engage the first gear;
- Press the “Continue” button;
- Repeat this procedure until the last gear has been engaged (the instrument supports gearboxes up to 9 gears);
- Once the last gear has been engaged, press the “End Calibration” button;
- Once the gear calibration has finished, it is absolutely necessary to transmit the calibration to your **MyChron 3 Plus/Gold** by pressing the “Transmit calibration” button.

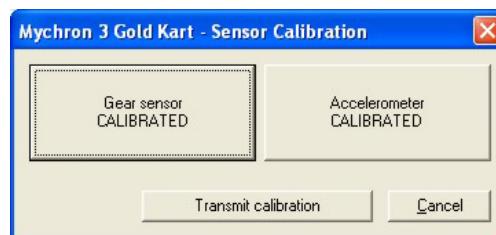


Fig. 4.9– Calibrated sensors

## 4.7 – Online visualization

Once you finished calibrating/autocalibrating the sensors, it is suggested to enter the “Online” mode, by pressing the Online button in the “Logger manager” main window, in order to verify that each channel has been correctly configured.

The “Online” visualization mode (see Figure 5.12) will allow you to control if the temperature/pressure sensors have been correctly set and if the gear sensor and the accelerometers have been correctly calibrated. It is also possible to see the “Battery charge level” and to start a test data acquisition, in order to verify that the system is correctly working.

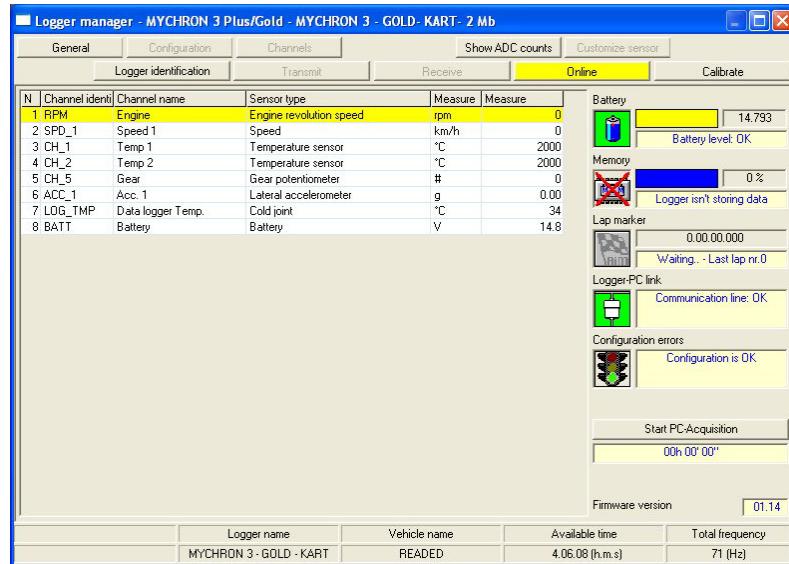


Fig. 4.10– Online visualization

**Attention: if the gear channel and the accelerometer one have not been correctly calibrated, it will not be possible both to acquire the current gear and, for MyChron 3 Gold only, to create the circuit map. It is recommended to pay a particular attention when calibrating/autocalibrating the channels.**

## Chapter 5 – “How to configure MyChron 3 Plus/Gold AUTO”

For a correct, complete and fast MyChron 3 Plus/Gold AUTO configuration, it is absolutely necessary to use a PC and the software Race Studio 2.

The “via software configuration” allows the user to set some parameters that cannot be set using the keyboard. For instance, the temperature sensors (thermocouples, thermoresistances, VDO sensors) or the pressure ones, cannot be set via keyboard and so, if you wish to measure temperature or pressure, you have to configure your **MyChron 3 Plus/Gold** using **Race Studio 2**. Moreover, if you bought a **MyChron 3 Gold** and you wish to measure the lateral g-force (in order to create a track map), you have to calibrate it via software.

Before starting the via software configuration, it is reminded to install **Race Studio 2** and the USB drivers, as mentioned in chapters 1 and 2. It is also reminded that, before configuring the instrument, you have to connect it to a PC and to switch it on.

Once launched the program, by double-clicking on the **Race Studio 2** icon on your PC’s desktop or by selecting the **Race Studio 2** shortcut in your PC’s Start toolbar, it will appear the software’s main window, as shown in Figure 5.1:

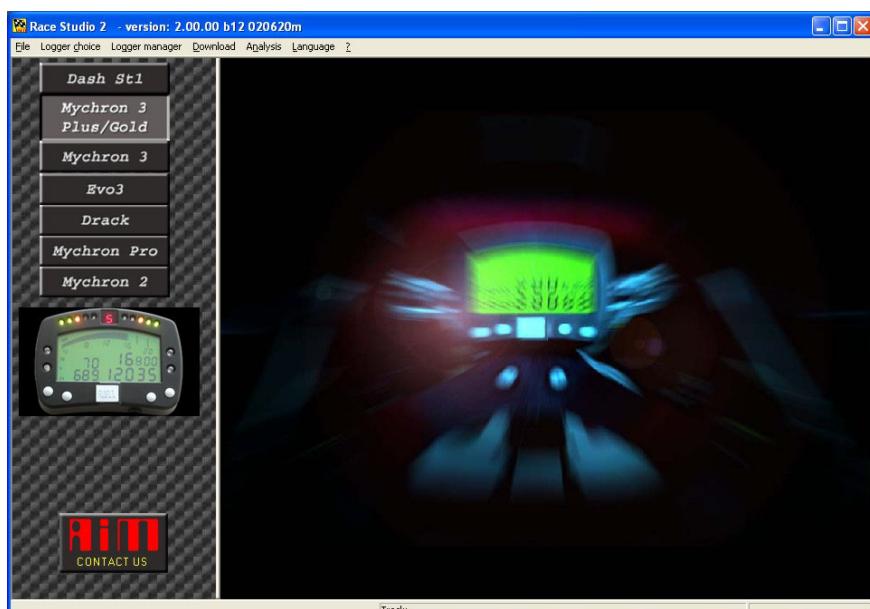


Fig. 5.1– *Race Studio 2* main window

On the left of the window you may see the icons corresponding to all the Aim instruments supported by **Race Studio 2**: **Dash ST1**, **MyChron 3 Plus/Gold**, **MyChron 3**, **Evo 3**, **Drack**, **MyChron Pro**, **MyChron 2**.

To select **MyChron 3 Plus/Gold**, please click on the corresponding icon (as showed in Figure 5.1).

### 5.1 – Creating a new configuration

It is now possible to configure the instrument: in order to start the configuration procedure, please click on the Logger manager icon, located in **Race Studio 2** toolbar.

Once clicked the Logger manager icon, it will appear the New configuration window, as showed in Figure 5.2.



Fig. 5.2– New configuration window

The user will have to set some parameters, listed here above:

- Data logger type: at choice between **MyChron 3 Plus/Gold** and **Auto/Kart**. Please, remember to select the **AUTO** version;
- Vehicle name;
- Speed measure unit: at choice between km/h and Mph;
- Temperature measure unit: at choice between °C and °F;
- Pressure measure unit: at choice between Bar and PSI.

Once filled all the boxes of the previous screenshot, click on the *OK* pushbutton to save the settings. On your PC's monitor it will appear the Logger manager main window (Figure 5.3).

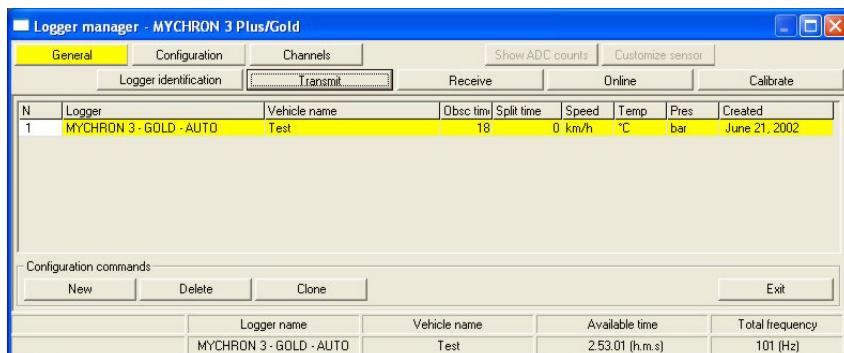


Fig. 5.3– Logger manager main window

Here above you can see a short description of all the pushbuttons that can be used to configure your **MyChron 3 Plus/Gold**:

- *General*: with this pushbutton you activate the *Logger manager* main window;
- *Configuration*: this pushbutton will open a very useful dialog box, where the user is allowed to set the temperature and pressure alarm values, the RPM shift light threshold values, the RPM and speed parameters and the measure units;
- *Channels*: by using this option you may visualize the sensors installed on your vehicle;
- *Customize sensor*: this pushbutton allows the user to customize a sensor, setting the sensor's calibration curve;
- *Logger identification*: this button allows the user to detect the characteristics of the data logger connected to the PC;
- *Transmit*: once configured the data logger, the parameters have to be transmitted to the instrument by clicking this button;

- *Receive*: if you connect to a PC a data logger of whom you do not know the configuration, you may detect its configuration, by clicking the *Receive* button, and to save it in the configuration's database;
- *Online*: the *Online* button allows the user to make a data acquisition simulation, in order to verify if the new configuration is correct and if it has been correctly transmitted to the data logger;
- *Calibrate*: this button allows the user to calibrate both the lateral accelerometer and the gear sensor;
- *New / Delete / Clone*: these three buttons allows the user to create a new configuration, to delete an old one or to clone an existing one;
- *Exit*: this button is used to exit the “Logger manager” menu.

## 5.2 – Channels

Clicking on the Channels pushbutton it will appear the following screenshot:

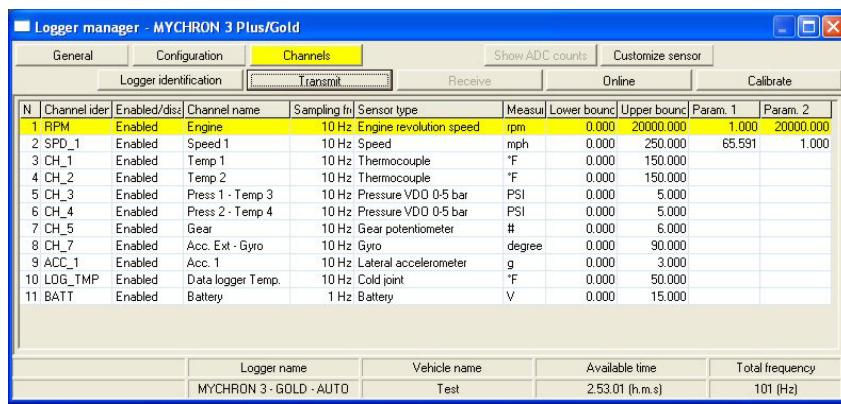


Fig. 5.4– Channels configuration window

In Figure 5.4 it is possible to set the channels acquired by your **MyChron 3 Plus/Gold**.

- Channels labelled as CH\_1 and CH\_2 represent two temperature inputs: the user may set the correct temperature sensor by double clicking in the cell corresponding to the “sensor type” column and to the CH\_X row and choose the proper temperature sensor;
- Channels labelled as CH\_3 and CH\_4 may be used to acquire a temperature input or a pressure one. As previously described, the user may choose the sensor among a long list of Aim standard sensors or, otherwise, may set a *custom* sensor by selecting the “Custom sensor management” (see *Custom sensor* paragraph).

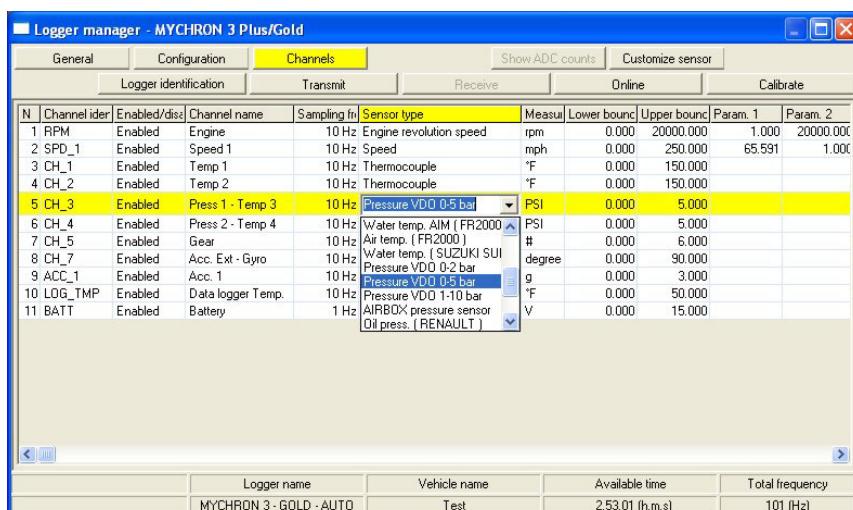


Fig. 5.5– Channels configuration window: setting a channel

- If your **MyChron 3** is a **Gold** version one, you may also install an external lateral accelerometer (cars) or a gyroscope (motorbikes). Your **MyChron 3 Gold** version has also an internal lateral g-sensor, labelled as CH\_7, which will allow you to create the circuit map.

### 5.3 – Customize sensor

By using this function, the user can configure a “custom” sensor, setting the sensor’s calibration curve. This option is very useful when the sensor (pressure, temperature or other) installed on the vehicle does not appear in the default sensors list.

It is reminded that the “Customize sensor” option is intended only for expert users.

To enter this function, please press button *Customize sensor*: it will appear the following screenshot (Figure 5.6).

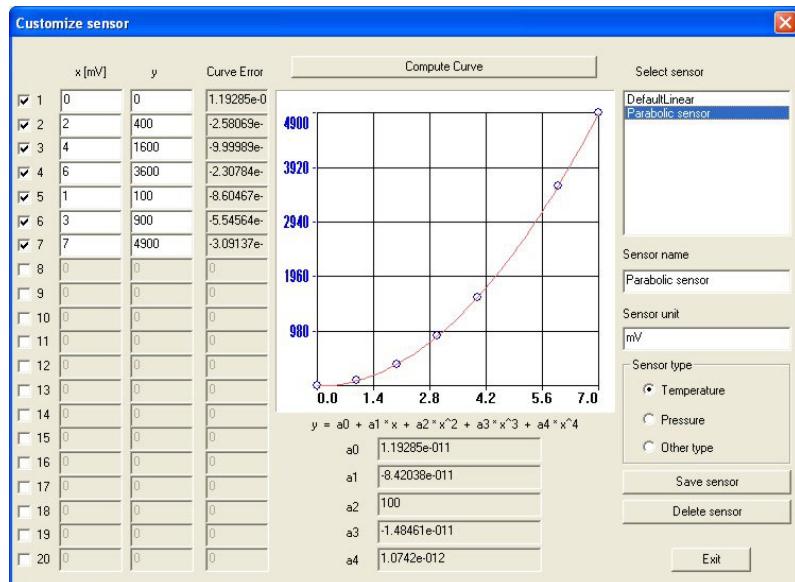


Fig. 5.6– *Channels* configuration window: setting a channel

In the Figure’s left part there are three columns: in the first one it is possible to insert the instrument’s output voltage (i.e. the *abscissa* values of the calibration curve), while in the second one it is possible to insert the temperature/pressure value corresponding to the previous voltage (i.e. the *ordinate* values of the calibration curve). These values will be interpolated using a polynomial. In the third column it is reported the “Curve Error”, i.e. the difference between the computed curve and the experimental values.

To set how many experimental values you wish to use to create the calibration curve, please place a check in the column besides the abscissa values.

In the window’s middle part it is reported both the sensor’s calibration curve and the 5 coefficients (from  $a_0$  to  $a_4$ ) of the interpolation polynomial. Please, use button “Compute Curve” to refresh the calibration curve to apply any changes.

On the right of the calibration curve there are some boxes, where you can insert the sensor name, the desired measure units and the sensor type (Temperature, Pressure or Other).

Below these boxes there are some pushbuttons which allow the user to save or delete a customized sensor.

In the window’s upper right corner you can see some default “custom” sensors. If you wish to load one, please click twice on the sensor’s name.

Once correctly defined the new sensor, the user may exit *Customization sensor* mode, by clicking on the *OK* pushbutton, and has to set the new sensor on the desired channel (press button *Channels* and follow the instructions reported in the *channels* paragraph).

## 5.4 – Channels configuration

Your **MyChron 3 Plus/Gold** is equipped with 14 fully configurable coloured led; the 4 ones placed on the left and right of the display unit represent the 4 analog inputs (temperatures and pressures) *maximum* alarms, while the other 10 led in the upper part of the display are called *Shift light*.

By clicking on the *Configuration* icon it will appear the channels configuration window, shown in Figure 5.7.

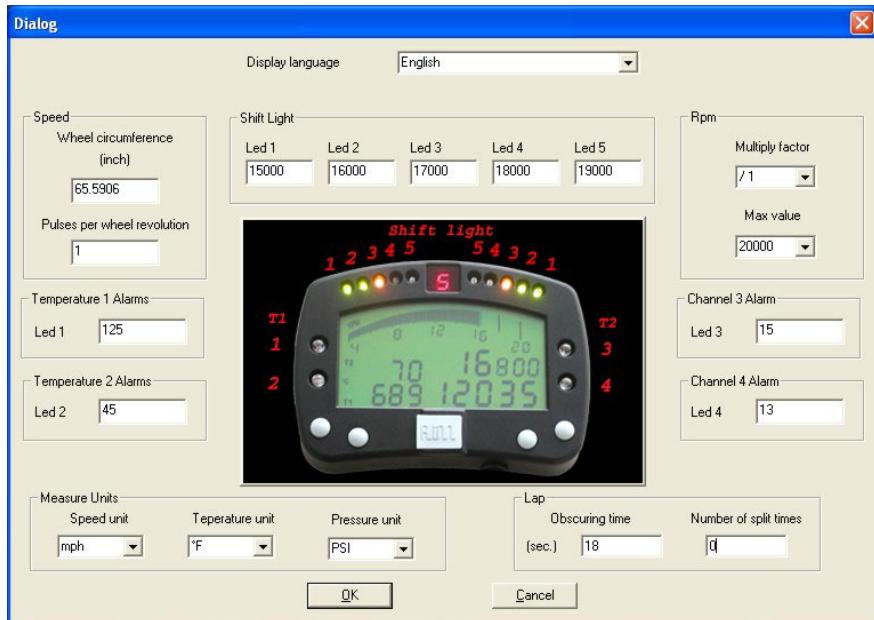


Fig. 5.7 – *Channels* configuration window

- *Wheel circumference*: this function allows the user to set wheel circumference (in mm or in inches); this value is fundamental to correlate the wheel revolution speed and the vehicle speed.
- *Number of pulses per wheel revolution*: this function allows the user to set the number of pulses per wheel revolution (i.e. the phonic wheel teeth number), in order to measure the wheel revolution speed. When the sensor passes by a gear tooth, it generates an electric pulse if the phonic wheel is made up of just one tooth, the instrument will measure one impulse per lap, while, if it is made up of more than one tooth, the number of pulses per lap will be greater than one.
- *Configuring the Shift light led*: in the window's middle part it is possible to set 5 RPM values, each one corresponding to a coloured led. The five led progressively turn on in order to indicate the pilot to shift gear. To set the proper RPM value, you have to modify the values in the different boxes. The 10 led are so coloured: the first two on the left and the first two on the right are green coloured, the middle ones are orange coloured and the last four are red. When the engine reaches the RPM value set in the 5<sup>th</sup> box, all the five led start blinking, informing the pilot to change gear. If a value is set to 0, the corresponding led will be disabled.
- *Number of pulses per engine revolution*: this option represents the number of pulses, acquired from the coil or from the ECU, per engine revolution. The user may choose the multiply factor among these values: /1, /2, /3, /4, /6 and \*2. For instance, the correct value for a 4 strokes 4 cylinders engine is /2.
- *Maximum RPM value*: this option allows the user to set the Maximum RPM value acquired by the instrument.
- *Configuring the 4 alarms led*: the 4 red coloured led represent the *Maximum* alarm for the 4 analog inputs (temperatures and pressures). If the value is set to 0, the corresponding led will be disabled.
- *Configuring the measure unit*: the user can set the Speed (Km/h or Mph), Temperature (°C or °F) and Pressure (Bar or PSI) measure unit.

- *Configuring the lap parameters:* by setting these two parameters, the user will be able to acquire the correct lap time and, if more than one optic transmitter is available, the split times.
- *Language selection:* the user may choose the display text language among 6 different languages: Italian, English, German, Spanish, French and Slovenian.

## 5.5 – Transmitting the configuration

It is recommended, before transmitting the configuration, to switch on the instrument and to connect it to the PC's USB port.

Once set all the parameters, it is necessary to transmit the configuration to the instrument.

In order to transmit the configuration, you have to press the *Transmit* pushbutton and the system, automatically, will download the configuration from the PC to the instrument's Flash memory.

If the data logger is not correctly connected to the PC's USB port or if the data logger is switched off when transmitting the configuration, it will appear the following screenshot on your PC's monitor:



Fig. 5.8 – Warning message window

Please, ensure that the data logger is switched on and correctly connected to the PC and then retry to transmit the configuration.

## 5.6 – Accelerometer autocalibration (Gold versions only)

Once the configuration has been transmitted to the instrument, it is possible to calibrate the gear sensor and the accelerometers installed on the car. In particular the sensors that need to be calibrated are the gear sensor (**MyChron 3 Plus** and **Gold** versions) and the lateral/external accelerometer (**Gold** versions only).

To enter calibration dialog box, reported here above, it is necessary to press “Calibrate” button.

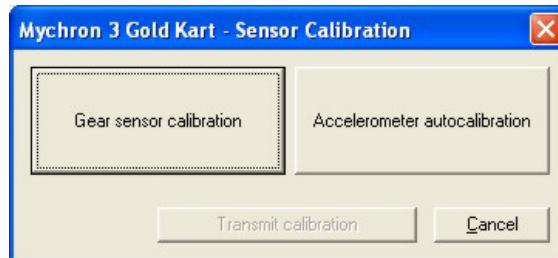


Fig. 5.9 – Sensor calibration window

In this window you can see two big buttons: the “Gear sensor calibration” button, on the left, and the “Accelerometer autocalibration” one, on the right. In the window's lower part there are two other buttons: the “Cancel” one, used to exit calibration, and the “Transmit calibration” one (which becomes enabled once you have calibrated the gear sensor or the accelerometer).

By pressing the “Accelerometer autocalibration” button, the software will automatically autocalibrate the internal lateral accelerometer and, if installed, the external g-sensor/gyroscope.

## 5.7 – Gear calibration

To calibrate the gear sensor, once entered calibration mode by clicking the “calibrate” button, to select the “Gear sensor calibration” button. It will appear the following screenshot:

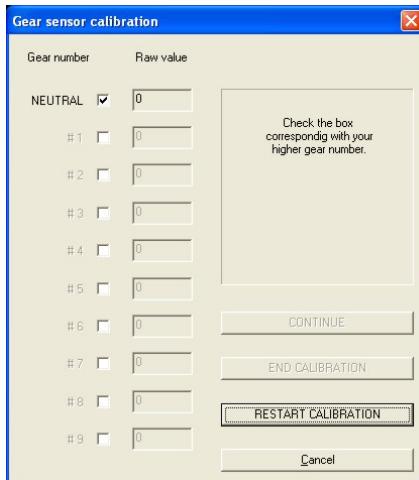


Fig. 5.10 – *Gear sensor calibration* window

Now, please follow the instructions listed here above:

- Check the box corresponding to the gearbox’s gear number;
- Engage the neutral gear;
- Press the “Continue” button;
- Engage the first gear;
- Press the “Continue” button;
- Repeat this procedure until the last gear has been engaged (the instrument supports gearboxes up to 9 gears);
- Once the last gear has been engaged, press the “End Calibration” button;
- Once the gear calibration has finished, it is absolutely necessary to transmit the calibration to your **MyChron 3 Plus/Gold** by pressing the “Transmit calibration” button.

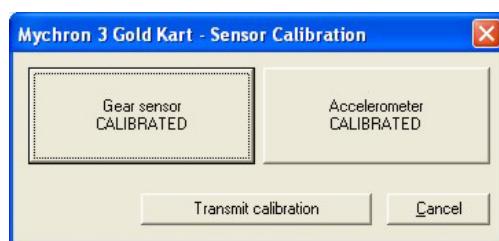


Fig. 5.11 – Calibrated sensors

## 5.8 – Online visualization

Once you finished calibrating/autocalibrating the sensors, it is suggested to enter the “Online” mode, by pressing the Online button in the “Logger manager” main window, in order to verify that each channel has been correctly configured.

The “Online” visualization mode (see Figure 5.12) will allow you to control if the temperature/pressure sensors have been correctly set and if the gear sensor and the accelerometers have been correctly calibrated. It is also possible to see the “Battery charge level” and to start a test data acquisition, in order to verify that the system is correctly working.

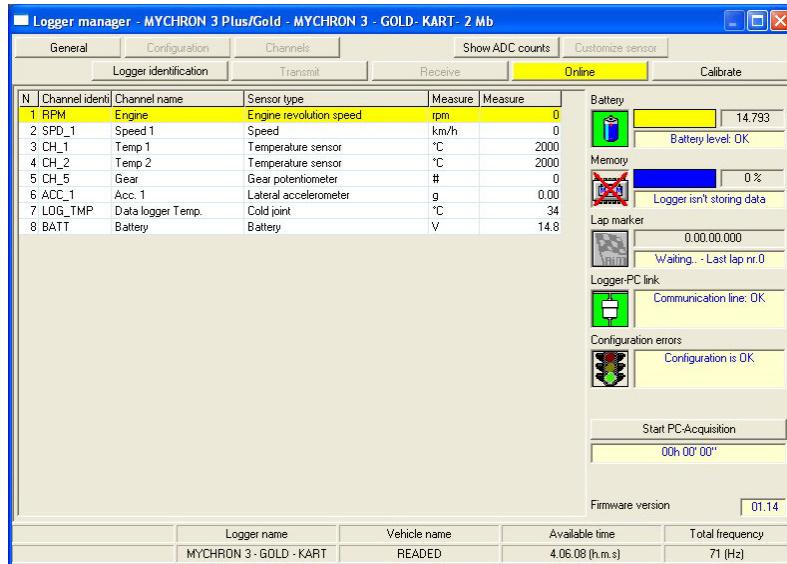


Fig. 5.12– Online visualization

**Attention: if the gear channel and the accelerometer one have not been correctly calibrated, it will not be possible both to acquire the current gear and, for MyChron 3 Gold only, to create the circuit map. It is recommended to pay a particular attention when calibrating/autocalibrating the channels.**

## Chapter 6 – “How to configure Dash ST1”

The “via software configuration” allows the user to set some parameters that cannot be set using the keyboard.

It is reminded that, before starting the via software configuration, to install Race Studio 2 and the USB drivers as mentioned in the previous chapter. It is also reminded, before configuring the instrument, to connect it to a PC and to switch it on.

Once launched the program clicking on the **Race Studio 2** icon, it will appear the screenshot showed in Figure 6.1.

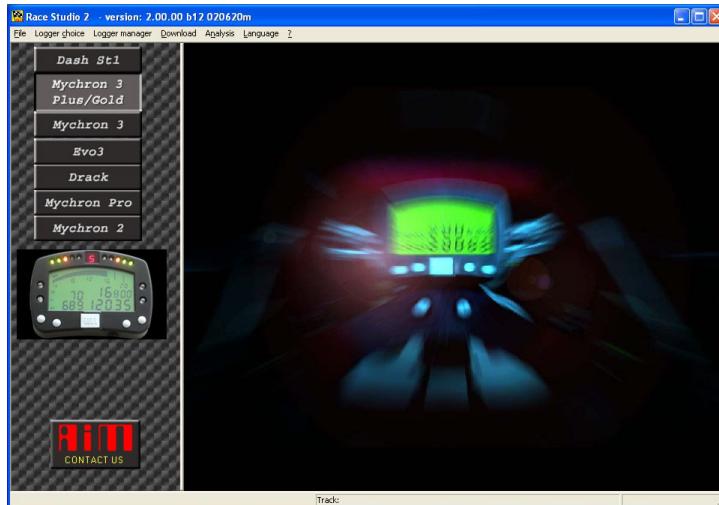


Fig. 6.1– Race Studio 2 main window

On the left of the window you will see the icons corresponding to all the Aim instruments supported by **Race Studio 2**: **Dash ST1**, **MyChron 3**, **MyChron 3 Plus/Gold**, **Evo 3**, **Drack**, **MyChron Pro**, **MyChron 2**. To select **Dash ST1**, please click on the corresponding icon.

### 6.1 – Creating a new configuration

Now it is possible to configure the instrument: in order to start the configuration procedure, please click on the icon *Logger manager*.

It will appear the screenshot showed in Figure 6.2.

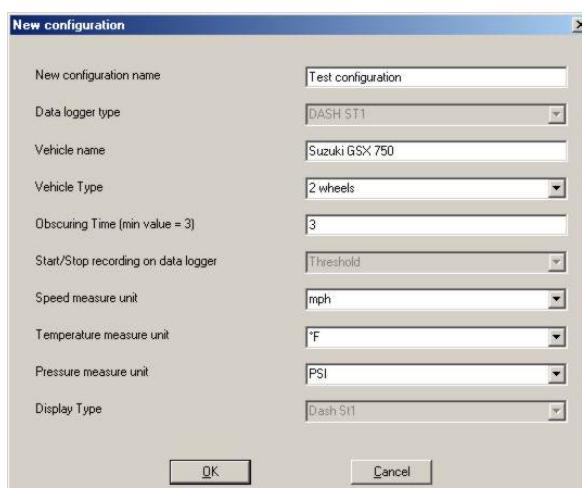


Fig. 6.2– New configuration window

The user will have to set some parameters, listed here above:

- New configuration name;
- Vehicle name;
- Vehicle's wheels number: at choice between 2 and 4;
- Beacon receiver's obscuring time: minimum value 3 and maximum value 59 seconds;
- Speed measure unit: at choice between km/h and Mph;
- Temperature measure unit: at choice between °C and °F;
- Pressure measure unit: at choice between Bar and PSI.

Once filled all the boxes of the previous screenshot, click on the *OK* pushbutton to save the settings. On your PC's monitor it will appear the Figure 6.3:

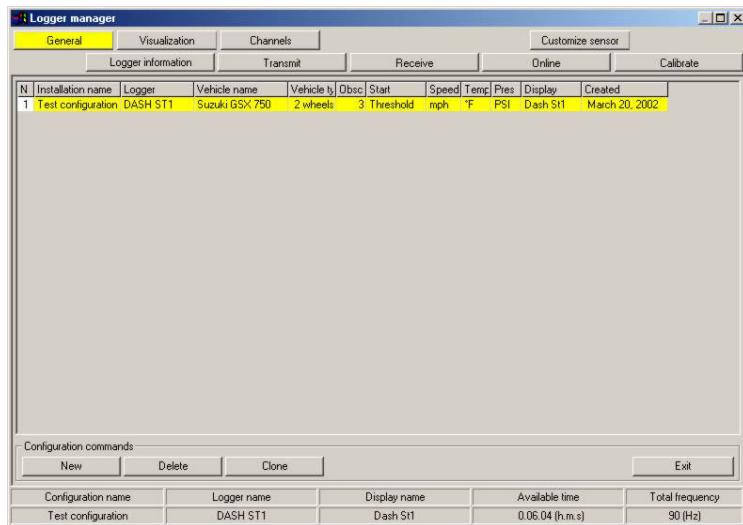


Fig. 6.3– *Logger manager* main window

Here above you can see a short description of all the pushbuttons that can be used to configure your **Dash ST1**:

- *General*;
- *Visualization*: this pushbutton allows you to set the pressure and temperature alarms values and to set the RPM changing gear threshold values;
- *Channels*: by using this option you can set how many and which kind of sensors are installed on your vehicle;
- *Customize sensor*: this pushbutton allows the user to customize a sensor, setting the sensor's calibration curve;
- *Logger information*: this button allows the user to detect the characteristics of the data logger connected to the PC;
- *Transmit*: once configured the data logger, the parameters have to be transmitted to the instrument by clicking this button;
- *Receive*: if you connect to a PC a data logger of whom you do not know the configuration, you may detect its configuration, by clicking the *Receive* button, and to save it in the configuration's database;
- *Online*: the *Online* button allows the user to make a data acquisition simulation, in order to verify if the new configuration is correct and if it has correctly been transmitted to the data logger;
- *New / Delete / Clone*: these three buttons allows the user to create a new configuration, to delete an old one or to clone an existing one;
- *Exit*: this button is used to exit the “Logger manager” menu.

## 6.2 – Channels

Clicking on the *Channels* pushbutton it will appear the following screenshot:

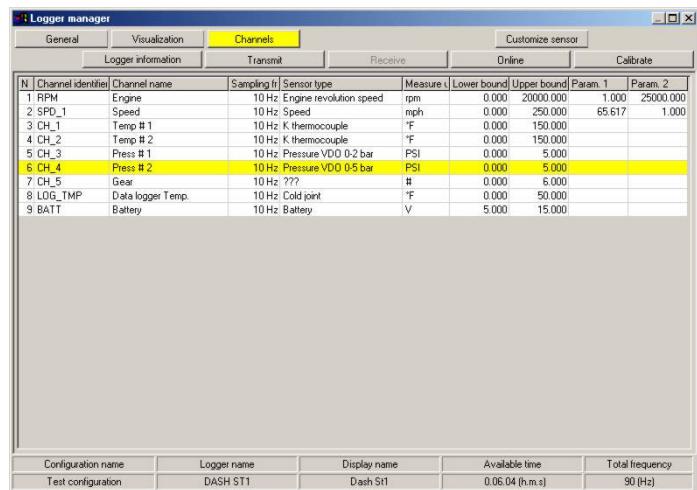


Fig. 6.4– *Channels* configuration window

As you can see, there are some fixed channels (labelled as number 1, 2, 8 and 9) which cannot be modified by the user, while the channels from 3 to 7 (labelled as CH\_1, CH\_2, CH\_3, CH\_4 and CH\_5) can be set by the user.

- On channels CH\_1 e CH\_2 it is possible to connect only temperature sensors: to set the installed sensor it is necessary to click twice in the box corresponding to the “channel 1” row and the “Sensor type” column.
- On channels CH\_3 and CH\_4 it is possible to install two pressure sensors: the installation procedure to install the sensor is similar to the one described for the temperature sensor installation.
- On channel CH\_5 you have to connect the potentiometer which acquires the current gear. To set the sensor type, click twice in the correct box and select the sensor you have installed in your gearbox. If no sensor is selected, the channel will be disabled. This channel, unlike the previous four, has to be calibrated: to calibrate the sensor, please carefully follow the instructions reported on page 17.

If the sensor installed on your vehicle does not appear in the default sensors list, it is recommended to use the Sensors customisation option, described on page 43.

## 6.3 – RPM configuration

To configure the RPM channel it is necessary to click twice in the box corresponding to the *Engine revolution speed* row and the *Param. 1* column.

The following screenshot will appear on your PC's monitor:

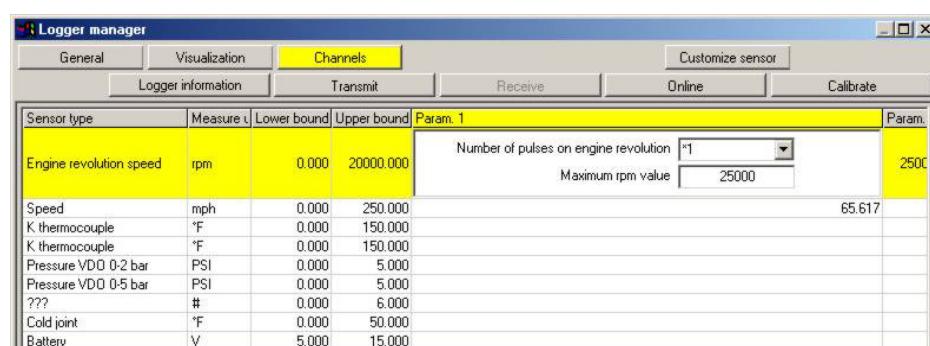


Fig. 6.5– *RPM* configuration

The user will have to set the following parameters:

- *Number of pulses on engine revolution*: this option represents the number of pulses, acquired from the spark plug wire or from the ECU, per engine revolution. A two-strokes one-cylinder engine has one spark signal per revolution, while a four-strokes one-cylinder engine has one spark signal per two engine revolutions.
- *Maximum RPM value*: this option allows the user to set the Maximum RPM value acquired by the instrument. **It is strongly recommended to set this parameter at the same value of the analogical revolutions counter upper boundary value.**

## 6.4 – Speed configuration

To configure the speed channel it is necessary to click twice in the box corresponding to the *Speed* row and the *Param. 1* column.

The following screenshot will appear on your PC's monitor:

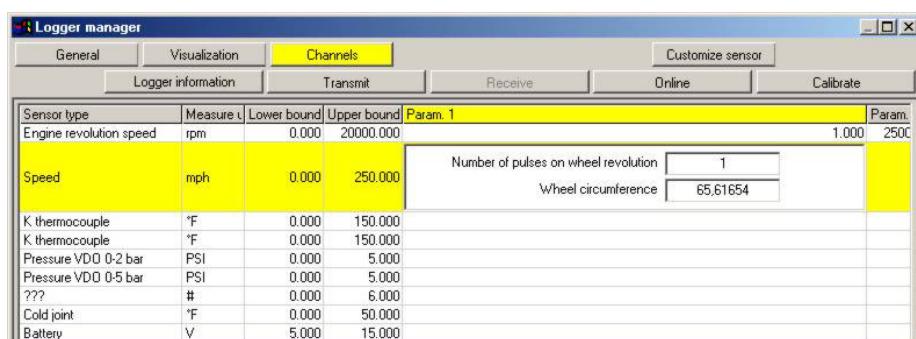


Fig. 6.6 – *Speed* configuration

The user will have to set the following parameters:

- *Number of pulses on wheel revolution*: this function allows the user to set the number of magnets installed on the wheel in order to measure the wheel revolution speed. When the sensor passes by the magnet, it generates an electric pulse: if I install just one magnet, the instrument will measure one pulse per wheel revolution, while if I install more than one magnet the sensor will acquire more than one pulse per wheel revolution.
- *Wheel circumference*: this function allows the user to set wheel circumference ( in mm or in inches ); this value is fundamental to correlate the wheel revolution speed and the vehicle speed.

## 6.5 – Customize sensor

By using this function, the user can configure a “custom” sensor, setting the sensor’s calibration curve. This option is very useful when the sensor (pressure, temperature or other) installed on the vehicle does not appear in the default sensors list.

**It is reminded that the “Customize sensor” option is intended only for expert users.**

To enter this function, please press button *Customize sensor*: it will appear the following screenshot (Figure 6.7).

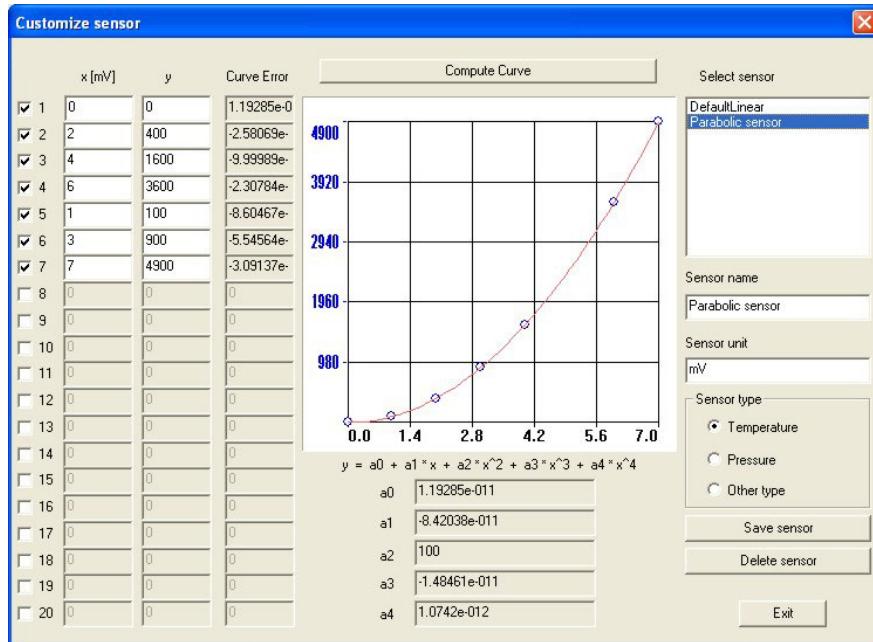


Fig. 6.7– *Channels* configuration window: setting a channel

In the Figure's left part there are three columns: in the first one it is possible to insert the instrument's output voltage (i.e. the *abscissa* values of the calibration curve), while in the second one it is possible to insert the temperature/pressure value corresponding to the previous voltage (i.e. the *ordinate* values of the calibration curve). These values will be interpolated using a polynomial. In the third column it is reported the “Curve Error”, i.e. the difference between the computed curve and the experimental values.

To set how many experimental values you wish to use to create the calibration curve, please place a check in the column besides the abscissa values.

In the window's middle part it is reported both the sensor's calibration curve and the 5 coefficients (from  $a_0$  to  $a_4$ ) of the interpolation polynomial. Please, use button “Compute Curve” to refresh the calibration curve to apply any changes.

On the right of the calibration curve there are some boxes, where you can insert the sensor name, the desired measure units and the sensor type (Temperature, Pressure or Other).

Below these boxes there are some pushbuttons which allow the user to save or delete a customized sensor.

In the window's upper right corner you can see some default “custom” sensors. If you wish to load one, please click twice on the sensor's name.

Once correctly defined the new sensor, the user may exit *Customization sensor* mode, by clicking on the *OK* pushbutton, and has to set the new sensor on the desired channel (press button *Channels* and follow the instructions reported in the *channels* paragraph).

## 6.6 – Alarms setting

The **Dash ST1** is equipped with 9 fully configurable coloured led; the 4 led in the lower right part of the display represent temperature and pressure alarms, while the 5 led in the upper right part of the display progressively turn on when the RPM changing gear gets nearer.

By clicking on the *Visualization* icon it will appear the screenshot shown in Figure 6.8.

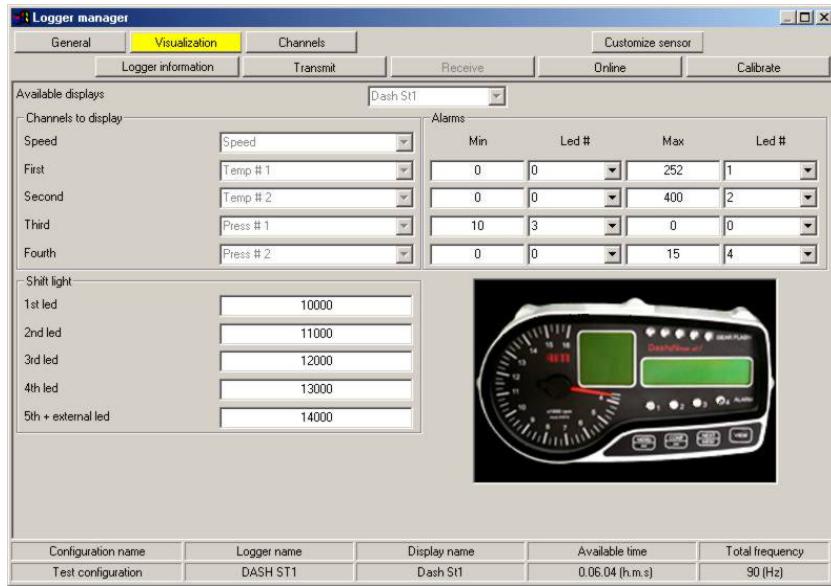


Fig. 6.8– Alarms setting window

- *Configuring the pressure / temperature alarm led:* the first thing you have to do is to decide which led has to indicate a particular alarm; because of the channels numbering ( number 1 and 2 are temperature channels while number 3 and 4 are pressure channels ) it is suggested to respect the following sequence: *Temperature 1* on led 1, *Temperature 2* on led number 2, *Pressure 1* on led 3 and *Pressure 2* on led 4. Now the user can choose if he wishes to set a *Maximum* alarm, which means that the led will turn on when the measured data reaches a value **greater** than the alarm one, or a *Minimum* alarm, which turns on when the measured data reaches a value **lower** than the alarm one. In the example reported in the previous page, led number 1, 2 and 4 have been configured as *Maximum* alarms, while channel 3 as a *Minimum* alarm.
- *Configuring the changing gear led:* in the window's lower left part it is possible to set 5 RPM values, each one corresponding to a coloured led. The five led progressively turn on in order to indicate the pilot to change gear. To set the proper RPM value, you have to modify the values in the different boxes. The 5 led are so coloured: the first two are green coloured, the 3<sup>rd</sup> one's colour is orange and the last two ones are red. When the engine reaches the RPM value set in the 5<sup>th</sup> box, all the five led start blinking, informing the pilot to change gear. When the 5<sup>th</sup> led turns on, it also turns on the external gear flash. The RPM value can be set between a minimum of 0 and a maximum of 29999. If you set the alarm value at 0, the corresponding led will be disabled.

## 6.7 – Transmitting the configuration

It is recommended, before transmitting the configuration, to switch on the instrument and to connect it to the PC's USB port.

Once set all the parameters, it is necessary to transmit the configuration to the instrument.

In order to transmit the configuration, you have to press the *Transmit* pushbutton and the system, automatically, will download the configuration from the PC to the instrument's Flash memory.

If the data logger is not correctly connected to the PC's USB port or if the data logger is switched off when transmitting the configuration, it will appear the following screenshot on your PC's monitor:



Fig. 6.9– Warning message window

Please, ensure that the data logger is switched on and correctly connected to the PC and then retry to transmit the configuration.

## 6.8 – Gear calibration

To calibrate the gear sensor, once entered calibration mode by clicking the “calibrate” button, to select the “Gear sensor calibration” button. It will appear the following screenshot:

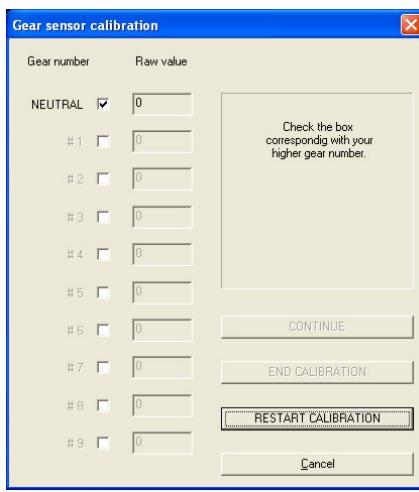


Fig. 6.10– Gear sensor calibration window

Now, please follow the instructions listed here above:

- Check the box corresponding to the gearbox’s gear number;
- Engage the neutral gear;
- Press the “Continue” button;
- Engage the first gear;
- Press the “Continue” button;
- Repeat this procedure until the last gear has been engaged (the instrument supports gearboxes up to 9 gears);
- Once the last gear has been engaged, press the “End Calibration” button;
- Once the gear calibration has finished, it is absolutely necessary to transmit the calibration to your gauge by pressing the “Transmit calibration” button.

## Chapter 7 – “How to download a test”

Once a test session has finished, it is possible to download the data stored in the instrument’s memory. In order to correctly download these data, please connect your data logger to the PC’s USB port by using the USB cable and to switch on the instrument.

### 7.1 – Downloading a test

To download the data, please run **Race Studio 2** and, then, click on the “Download” button, located in the commands toolbar: the file download will automatically start and it will appear the following screenshot:

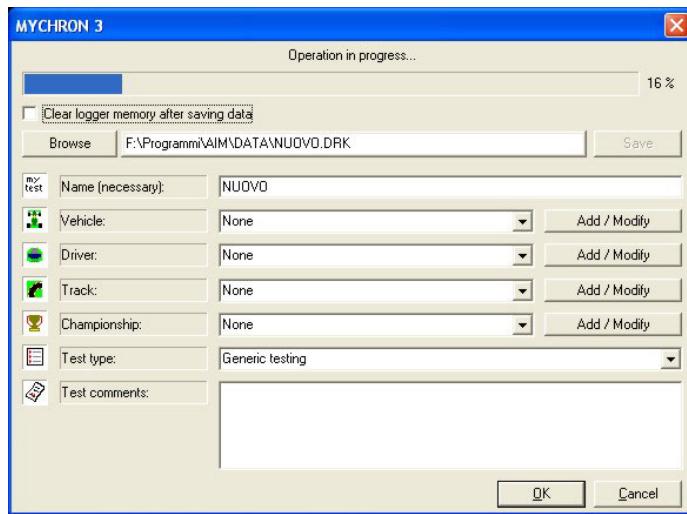


Fig. 7.1– Test download window

In the upper part of Figure 7.1 you can see a “wait-bar” which informs you on the download percentage status;

In the line directly below the download wait-bar, there is a function which allows the user to *Clear* the logger memory after saving data or to leave data in the instrument’s memory: if you wish to clear the memory after saving data, please place a check in the proper cell;

Once downloaded the instrument’s memory, the *Save* button, located on the right of the window, will become enabled. If the user presses this button without specifying the file name and the download folder, the file will be automatically saved in the default folder “X:\Program files\AIM\DATA” (where X represents the hard drive where you have installed **Race Studio 2**) with the default name “new.drk”.

If you wish to save the file with another name, please insert the file name in the “Name” box. Moreover, if you wish to save the file in custom folder, please press button “Browse”: you will be allowed to choose the desired folder, as showed in the following image.



Fig. 7.2– File name window

If you have not placed a check besides the “Clear logger memory after saving data” option, once you press button OK to exit download window, it will appear a dialog box where the user is allowed to choose whether to clear the or not to clear the logger memory. Please, select the desired option and exit download.



Fig. 7.3– Warning window

## 7.2 – Inserting the test in a database

**Race Studio 2** has a new and innovative tests storing system based on databases.

This storing system allows the user to save the files specifying 5 characteristics, such as the vehicle name, the driver, the track, the championship and the test type. Such information are saved together with the test file and are very useful, as they allow the user to group the files into self-defined categories, each one characterized by 5 attributes (vehicle, driver, track, championship and test type). When saving a new test file, it will be possible to insert this file in the previously set database categories or to create a new category.

When loading a test from database, the user may select the desired category from the database and all the tests which do not belong to that category will not be shown (in this case, the database works like a *filter*).

To insert a test in the database, please follow these instructions:

Once the download has finished, please enter the file name;

Then click on the “Add/Modify” button corresponding to the *Vehicle* attribute. It will appear the following window;

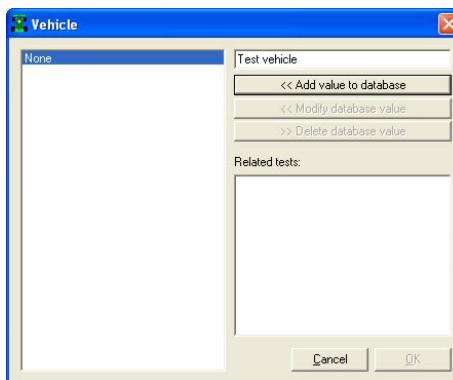


Fig. 7.4– Database attribute window

If the database is empty or you wish to create a new category, please fill the upper right box with the new Vehicle category and then click the “Add value to database” button. The new category will appear in the left column and the “OK” button will become enabled. Then click the “OK” button;

If the desired category appears in the previously set database categories (left column), you may select it by single-clicking on the name. Then click the “OK” button;

It is reminded that, if you do not wish to specify any category, the file will be saved in the database and the attributes will be set to “None”.

Please, repeat this procedure until the 5 categories have been filled. Once all the attributes have been set, like in the following image, please click the “OK” button.

